

# An Advanced Rapid Cycling CO<sub>2</sub> and H<sub>2</sub>O Control System for PLSS, Phase I

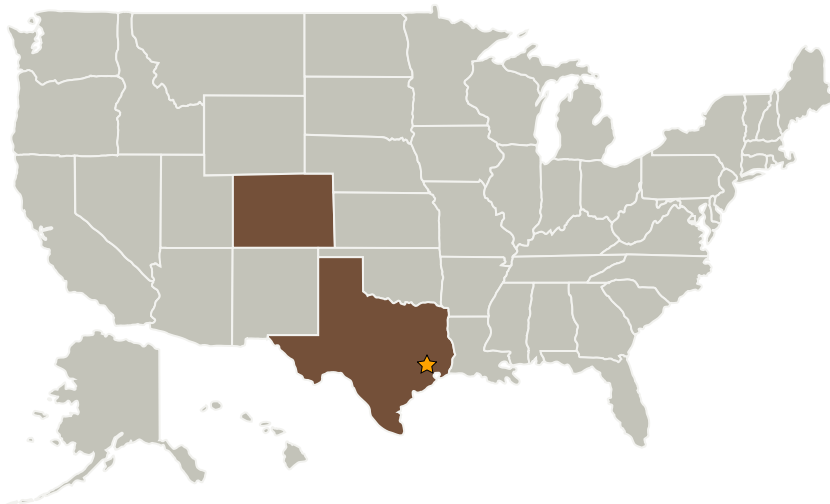
Completed Technology Project (2005 - 2005)



## Project Introduction

NASA's planned future missions set stringent demands on the design of the Portable Life Support Systems (PLSS) used to cool the astronaut and provide them with air. Dramatic reductions in weight, decreased reliance on supplies and greater flexibility on the types of missions are all needed. The CO<sub>2</sub> and humidity control unit in the existing PLSS design is relatively large, since it has to remove 8 hours worth of CO<sub>2</sub>. If the sorbent regeneration can be carried out during the extravehicular activity (EVA) with a relatively high regeneration frequency, the size and weight of the sorbent canister can be significantly reduced. TDA Research, Inc. (TDA) proposes to develop a compact, regenerable sorbent-based system to control CO<sub>2</sub> and humidity in the space suit ventilation loop. The sorbent can be regenerated using space vacuum during the EVA, eliminating many of the duration-limiting elements in the life support system. In the Phase I project, TDA will develop a suitable sorbent and carry out a preliminary design and engineering assessment of the system to determine whether the concept merits further research and development.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
TDA Research, Inc.	Supporting Organization	Industry	Wheat Ridge, Colorado



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Johnson Space Center (JSC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations

Colorado

Texas

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Project Manager:

Mary D Holland

### Principal Investigators:

Gokhan Alptekin

Natalie L Massey

## Technology Areas

### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - └ TX06.1.1 Atmosphere Revitalization